SIRPORC, a simple but powerful tool!

Author: Edson R. Montoro

I have always tried to understand the concepts and see how to translate to an application in a simple, uncomplicated way. But a tool that by itself is already simple does not have at first, with making it simpler still. This tool is the SIPOC, which means: Supplier, Input, Process, Output and Customer.

I looked hard at the origin of SIPOC, but I did not find who created this tool, some say it is a Six Sigma tool, but it came before Six Sigma and of course the Six Sigma methodology uses it. Others say it comes from the definition of Deming systems, but in my searches, I could not associate it with Deming. I believe that this idea comes from the area of software engineering, since they use the IPO (Input - Process - Output) concept from practically the beginning. But it does not matter, this tool has been used since the days of Quality, in the 80's and 90's, and until today is very used, due to its simplicity and ease of creating and understanding the limits of a process.

SIPOC is widely used to help process mapping, defining the inputs and outputs, delimiting the process; is basically the first tool to be used in the mapping.

A few years ago, I introduced two more letters in SIPOC, making it SIRPORC, because I thought the following: if I cannot simplify, we will increase and improve the tool, being careful not to complicate, trying to add without losing the simplicity. The first R comes from the Process Requirements for the suppliers and the second R, the Customer Requirements for the process being studied.

The article by Steve Spear and Kent Bowen (1999), Decoding the DNA of the Toyota Production System [1], introduces the concept of the 4 Rules in Use (Figure 1), explaining how

the Toyota factory floor works. People behave according to these rules, making this production process a world reference.

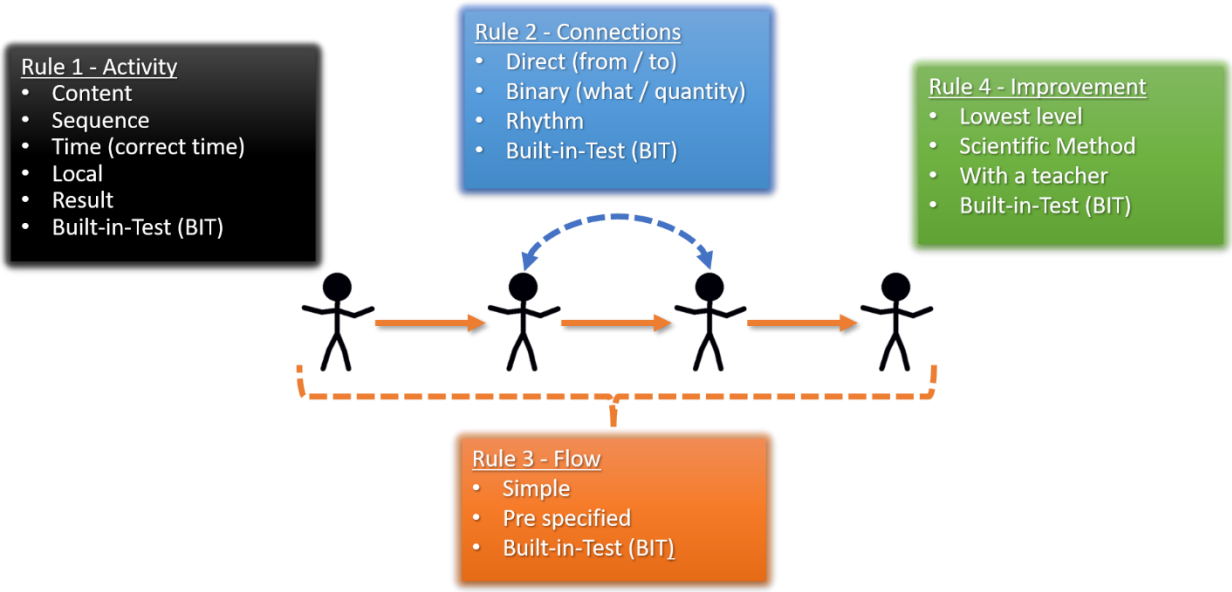

Figure 1 –4 Rules in Use.

The first rule is the activities rule that adds value, and any activity should be highly specified in terms of content, sequence, result, location, result and which tests should be embedded to ensure that the product generated by this activity is considered fit to move on to the next activity in the production chain. This product has a definition of the ideal, which is on customer demand, without defect, without waste (at the lowest cost), one by one and safe.

In order for the generated product to be sent to the next activity in which to add more value, there is a connection between this activity (process) and the next activity. The second rule defines that this connection has to be direct, binary, rhythmic and with built-in tests to ensure the correct connection.

When all activities (processes) are connected, one has to Rule 3: the pathway, which has to be predefined, simple and with built-in tests.

Rule 4, the rule of continuous improvement, determines that we have to at all times, improve activities, connections and pathways; with the use of a scientific methodology, guided by a sensei, with a built-in test to verify that the improvement actually occurred, and this applies at all levels of an organization.

Returning to the concept of SIRPORC, the addition of the two Rs I did before knowing the concept of the 4 rules in use, but after knowing it, further reinforced my belief that the two extra Rs made a lot of sense, especially with the Rule 2 (the Connection rule) because it is the connection of the Client - Supplier pair. Let us then go to the SIRPORC model (Figure 2) and some examples to demonstrate how simple and powerful it is.

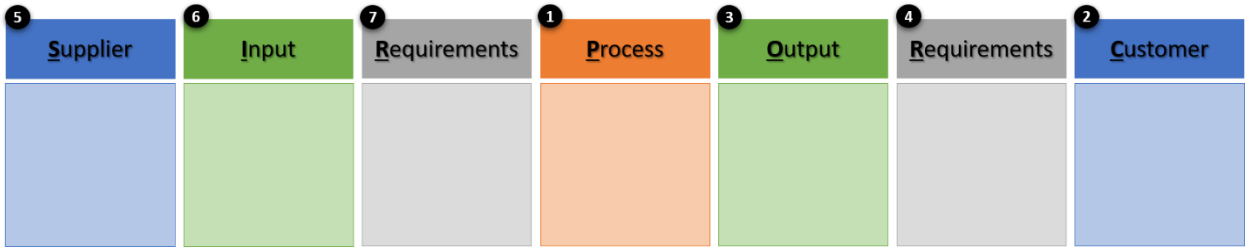

Figure 2 – SIRPORC and suggestion for filling it.

The filling of the SIRPORC model is very simple, I usually start with the Process, putting the name of the process, or sometimes a very simple flowchart of the main activities of the process; then I go to the Clients boxes, writing each of the clients in this process; so I set the outputs of the process aligning with the specific customers of each product, if necessary. For each product, I define, with the client obviously, the requirements he needs, setting the values, ranges or maximums and minimums.

Only after that, knowing exactly what customers want, I go to the suppliers, and for each input, I set the requirements I need to be able to serve the customers.

The following are some examples, showing how simple a SIRPORC can be.

Example 1:

This example is from a friend in the maintenance area, who was initiating the mapping of his area, and used SIRPORC to start this process.

<table>
<tr><th>S</th><th>I</th><th>R</th><th>P</th><th>O</th><th>R</th><th>C</th></tr>
<tr><td rowspan="2">Field operator</td><td>Open SS</td><td>Detailed description of the problem and a brief description of what maintenance should do. Must be allocated on the correct equipment and with priority set correctly.</td><td rowspan="3">Transform SS's into WO's;

See if PGI exists for the activity;

View the problem in the field to set up the activity step by step, defining all the resources and procedures required to carry out the activity and the estimated time for completion, that is, to form the work package;

Check if the resource of the shift is enough to carry out the activity, if not, inform the PCM of the need to appeal, or the attendant (weekend or holiday event).</td><td rowspan="2">Work package</td><td rowspan="2">Activity tasks listed in chronological order, with the amount of HH of each discipline, duly requested materials, procedures, releases and tools that will be used in the task</td><td rowspan="2">Shift execution team</td></tr>
<tr><td>Information on the problem for the field technician to evaluate in the field</td><td>Where? What happened? When did it happen? What are the apparent symptoms of the problem?</td></tr>
<tr><td>Shift technician</td><td>Visual and Measurable Symptoms of Equipment</td><td>Easy to detect and should be compared to the equipment standard</td><td>HH information per discipline the activity will need in addition to the HH of the shift</td><td>Required amount of additional HH per discipline and per task</td><td>PCM</td></tr>
<tr><td colspan="5"></td><td>Shift workers</td></tr>
</table>

Figure 3 – Process for planning the service order.

For the process of generating the WOs, it becomes clear what the suppliers are, what they provide and the needs of the process, as well as the process outputs and the customers with their

specifications. This is just a small process inside the maintenance area, which we use as an example to show the simplicity of the tool.

In this example, the process is well detailed, which is not normally necessary, but nothing prevents it from doing so.

Example 2:

In this other example is presented the process of production of aluminum alloys and primary aluminum, also of a friend who still works in this area.

S	I	R	P	O	R	C
Purchase Department	Anti Alloys	SI – 99%; AlTi – 75%; 85%; AlSr – 15%; AlFe – 90%; AlMn – 75%; Mg – 95%; AlCu – 75%	Alloys Manufacturing e Liquid Metal	Alloys	No surface oxides; Without lateral cavities; No stains; Stamping visible; Tied up waist; Clear identification; Deadline agreed; Quantity agreed; Desired chemical composition.	Client 1
Support Department	Services	Available Machinery; Reliable weightings; Homogenization; Scans; Furnace Cleaning				Client 2
Smelter	Liquid Metal	Temperature> 775 ° C; Grade P0506; Deadline; Selective running; Minimum of bath				Client 3
Technical Department	Services	Audits, Technical Support, Laboratory Analysis				⋮
Maintenance	Services	Ovens availabilities; Bridges; Ingot; Forklifts				Client K
				Primary metal	No surface oxides; Without lateral cavities; No stains; Stamping visible; Tied up waist; Clear identification; Deadline agreed; Quantity agreed; Desired chemical composition.	Client 1
						Client 2
						Client 3
						⋮
						Client K

Figure 4 – Manufacturing process of aluminum alloy.

The limits for the production process of aluminum and alloys have been defined, with their suppliers and inputs, as well as the outputs and their customers (kept in secrecy) to their specifications.

Obviously, the specifications must be agreed in advance with the customers, cannot be assumed that one already knows what the customers need and does not discuss with them.

SIRPORC is one of the main tools of a customer satisfaction assessment process, which will be addressed briefly.

Bibliography

[1] Spear, S.; Bowen, H. K. (1999), “Decoding the DNA of the Toyota Production System”; Harvard Business Review, Sept-Oct, pp 96.

About the author:

Edson R. Montoro is Technical Director of ERMontoro Consultoria e Treinamento Ltda, a company focused on people development and consulting in the areas of process improvement using Applied Statistics and Lean Manufacturing.

The author is a Chemist from UNESP (São Paulo State University "Júlio de Mesquita Filho") - Araraquara, MBA in Business Management from FGV (Fundação Getúlio Vargas), Master Black Belt from Air Academy Associates, Quality Engineer from ASQ (America Society for Quality) and a post-graduate degree in Production Management from UFSC (Federal University of Santa Catarina).